

gathering a set of information from a sensor, wherein said information is representative of a characteristic of said object;

creating Dempster-Shafer basic probability assignments (bpa's) based on said set of information, wherein said Dempster-Shafer bpa's represent a probability that said object comprises a target;

creating combinations of said Dempster-Shafer bpa's, wherein said combinations of said Dempster-Shafer bpa's represent the probability that said object comprises a target;

measuring an error present in said Dempster-Shafer bpa's and said combinations of said Dempster-Shafer bpa's, wherein said error is calculated according to $(\mu_d - \mu_o)^2$ wherein μ_d is a desired Dempster-Shafer bpa and μ_o is a Dempster-Shafer bpa based on said set of information;

calculating updates to said Dempster-Shafer bpa's and said combinations of said Dempster-Shafer bpa's based on said error; and

refining said probability of said object comprising a target by modifying said Dempster-Shafer bpa's and said combinations of said Dempster-Shafer bpa's based on said updates. --

REMARKS

The Office action dated August 12, 1999, and the references cited therein have been carefully considered. By this Amendment, claim 22 has been added. In view of the following remarks, Applicants submit that all pending claims are in condition for allowance.

Claim 22 has been added to more specifically recite the technique used to measure an error present in Dempster-Shafer bpa's and said combinations of Dempster-Shafer bpa's. Claim 22 recites that the error is calculated according to $(\mu_d - \mu_o)^2$ wherein μ_d is a desired Dempster-Shafer bpa and μ_o is a Dempster-Shafer bpa based on said set of information.

Rejections Under 35 U.S.C. §102 and 35 U.S.C. §103

Applicants respectfully traverse the rejection of claims 1-3, 5-15 and 17-21 as anticipated by Verly et al. (U.S. Patent No. 5,123,057) or as obvious over Verly et al. in view of Levy et al. (U.S. Patent No. 5,339,256).

Claims 1-3, 5-15 and 17-22 recite the steps of gathering a set of information from a sensor, creating Dempster-Shafer basic probability assignments (bpa's) based on the set of information, creating combinations of the Dempster-Shafer bpa's, measuring an error present in the Dempster-Shafer bpa's and the combinations of the Dempster-Shafer bpa's, calculating updates to the Dempster-Shafer bpa's and the combinations of the Dempster-Shafer bpa's, and modifying the Dempster-Shafer bpa's and the combinations of the Dempster-Shafer bpa's based on the updates. At least the steps of measuring an error present in the Dempster-Shafer bpa's and the combinations of the Dempster-Shafer bpa's, calculating updates to the Dempster-Shafer bpa's and the combinations of the Dempster-Shafer bpa's, and modifying the Dempster-Shafer bpa's and the combinations of the Dempster-Shafer bpa's based on the updates are not disclosed or suggested by Verly et al.

Verly et al. discloses a model-based pattern recognition system that operates by recursively matching information from sensors to predefined hierarchical models

of entities. While the Verly et al. system does employ Dempster-Shafer bpa's, Verly et al. does not, as the examiner contends, measure an error present in the Dempster-Shafer bpa's and combinations of the Dempster-Shafer bpa's. Rather, as disclosed in column 21, line 35 to column 23, line 9, Verly et al. calculates a degree of match between a model and each bpa combination and thereafter uses the degree of match to calculate a degree of confidence. Verly et al. does not mention measuring or calculating an error present in a Dempster-Shafer bpa or a combination of Dempster-Shafer bpa's as recited by claims 1-3, 5-15 and 17-22.

Even assuming, *arguendo*, that Verly et al.'s calculation of a degree of match can be considered to be the same as measuring an error present in a Dempster-Shafer bpa (a point that the applicants do not concede), Verly et al. still does not disclose calculating updates to the Dempster-Shafer bpa's and combinations of Dempster-Shafer bpa's based on the calculated error as recited by the claims. The examiner contends that column 46, lines 36-37 of Verly et al. disclose the calculation of updates. However, at this citation, Verly et al. merely teaches the concept of updating a bpa based on a simple support function using Dempster's rule of combination and does not teach the concept of updating a bpa based on an error as recited by claims 1-3, 5-15 and 17-22.

Furthermore, Verly et al. does not disclose modifying the Dempster-Shafer bpa's and the combinations of the Dempster-Shafer bpa's based on the updates. The examiner cites column 26, lines 1-2, as teaching the concept of refining probability assignments. However, at this citation, Verly et al. merely discloses setting a "has-match-list" attribute to a correct state. As disclosed in column 19, lines 52-61, the "has-match-list" attribute is a list containing a degree of match and

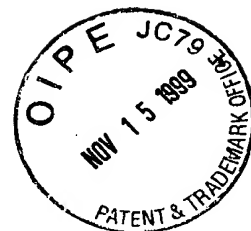
some matched data. Updating such an attribute is not the same as modifying Dempster-Shafer bpa's and combinations of Dempster-Shafer bpa's based on the updates as recited by claims 1-3, 5-15 and 17-22.

Verly et al. fails to disclose measuring an error in bpa's or combinations of bpa's and, therefore, cannot disclose calculating updates to bpa's and combinations of bpa's based on that error. Moreover, because Verly et al. does not calculate an error and therefore does not calculate updates based on the error, it cannot modify Dempster-Shafer bpa's and combinations of Dempster-Shafer bpa's based on the updates because the Verly et al. system never calculates updates. Accordingly, the disclosure of Verly et al. does not anticipate claims 1-3, 5-15 and 17-22.

Levy et al. discloses a system for recognizing an object, wherein the set of information used to create Dempster-Shafer basic probability assignments comprises opinions. Levy et al. fails to disclose measuring an error in bpa's or combinations of bpa's and, therefore, cannot disclose calculating updates to bpa's and combinations of bpa's based on that error.

It is clear that the prior art must make a suggestion of, or provide an incentive for a claimed combination of elements to establish a prima facie case of obviousness. *See, In re Oetiker*, 24 U.S.P.Q.2d 1443, 1446 (Fed. Cir. 1992); *Ex parte Clapp*, 227 U.S.P.Q. 972, 973 (Bd. Pat. App. 1985). Because neither Verly et al. nor Levy et al., discloses or even suggests measuring an error in bpa's or combinations of bpa's, calculating updates to bpa's and combinations of bpa's based on that error or modifying Dempster-Shafer bpa's and combinations of Dempster-Shafer bpa's based on the updates, as recited by claims 1-3, 5-15 and 17-22, it

follows that Verly et al. or Levy et al., either alone or in combination, cannot render any of claims 1-3, 5-15 and 17-22 obvious.



In conclusion, applicants respectfully submit that every ground for rejection has been overcome by the amendments and remarks herein. Accordingly, the application is believed to be in condition for allowance. If, for any reason, the examiner is unable to allow the application on the next Office action and feels that a telephone conference would help clear up any unresolved matters, the examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

Respectfully submitted,

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